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if not quite, at the end of the Noctuidæ."——Francis G. Sanborn, well known as a zealous and enthusiastic collector of insects, and a useful museum assistant, died suddenly June 5th, aged 46, while on a visit to Providence, at the house of George Hunt, Esq. He was one of the curators of the Natural History Society of Worcester. He was an amiable, generous man, and lepidopterists owe much to his willingness to communicate the rarities which he captured.——According to the researches of M. G. Carlet, the muscles of the abdomen of the bee are more numerous than they were supposed to be and, with the exception of the aliform muscles, which subserve circulation, are employed in respiration and consequently in calorification, which is important in the bee's economy. Thus the mechanism of respiration is more complicated than was before believed, since there is not only a lengthening and shortening of the abdomen, but an alternate approach and separation of its dorsal and ventral walls.——M. Ch. Brongniart, in his work upon the fossil insects of the coal beds of Commentry, describes a gigantic neuropter of the curious group of the Dictyoneura. This group contains insects which measure at least half a meter in length and $0.70^{m.}$ or about two feet four inches in spread of wings.

ZOÖLOGY.

A NEW INFUSORIAN BELONGING TO THE GENUS VORTICELLA.—The following heretofore undescribed infusorian occurs sparingly on the leaflets of Ceratophyllum in a pond near to, and often connected with, the Delaware river at Trenton, N. J.:

Vorticella lockwoodii, sp. nov.—Body when expanded broadly campanulate, not conspicuously changeable in form, the length about equaling the width, tapering posteriorly to the pedicel, and constricted beneath the border of the peristome, which is everted and equal in breadth to the entire length of the body; subspherical when contracted, and anteriorly crenulated; ciliary disc not elevated; cuticular surface bearing numerous scattered hemispherical or ovate elevations, diverse in size and usually collected about the equatorial region into irregularly disposed series, each prominence enclosing a nuclear nodule; parenchyma finely granular; contractile vesicles *two*, small, spherical, pulsating alternately; one placed somewhat above and in front of the other, near the pharyngeal passage; pedicel four to five times longer than the body. Length of the body and width of the expanded peristome field $\frac{1}{500}$ inch; width of the pedicel $\frac{1}{5000}$ inch. Habitat, pond water. Solitary or few together.

The characteristics by which this form may be readily distinguished from all Vorticellæ, are the existence and structure of the cuticular prominences and the undoubted presence of *two* contractile vesicles. The latter are in contour and position as stated above, but the writer would emphasize the fact of their duality. Hitherto no member of the genus has been observed with more than one pulsating vacuole, the latest generic diagnosis describing it as single without exception. The representation in the figure (Fig. 1, magnified 400 diameters) is somewhat diagrammatic, as both cannot be brought into focus at the same time. When the circular outline of one is distinctly visible, the pulsations only of the other can be distinguished; with a homogeneous immersion ⅛ inch objective, however, and the one inch (C) ocular, giving an amplification of nearly a thousand diameters, the systole of each can be seen alternately by manipulating the fine adjustment screw during the diastole, or *vice versa.*

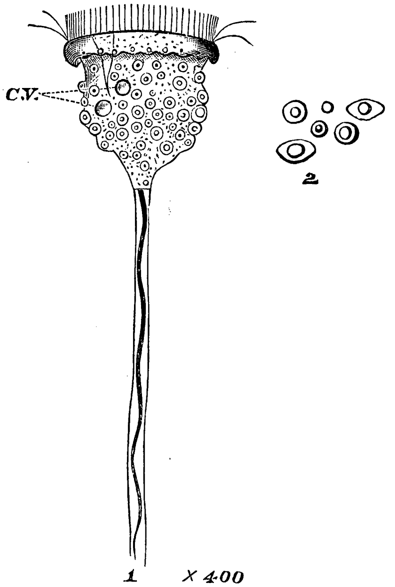

FIG. 1.—*Vorticella lockwoodii,* sp. nov. FIG. 2.—Cuticular elevations much enlarged.

The cuticular elevations are arranged in a series on the margin of the peristome border, but the nuclear bodies are there small and frequently obscure or absent. The prominences vary much in size even where most abundant. In contour they are generally hemispherical, but occasionally their outline is ovate, the two forms occurring on the same individual. The shape of the enclosed nucleus is uniformly the same in both, being that of a small circular disc, but that these internal bodies are disciform and not spherical, I have not been able to positively determine. They are, however, probably spherical.

The anterior and posterior regions of the body are, in some individuals, almost naked, while the cuticular prominences are usually more numerous centrally, with a tendency to collect into a more or less conspicuous equatorial zone. Some of the constituents of this belt, with their apparently disc-shaped nuclei, are shown greatly enlarged in Fig. 2.

It affords me much pleasure to dedicate this remarkable member of a remarkable genus to the Rev. Samuel Lockwood, Ph.D., an illustrious naturalist by whose friendship I am honored.—*Alfred C. Stokes, M.D.*

A NEW SPECIES OF INFUSORIAN.—In the Proceedings of the Canadian Institute, Vol. I, Part 4, I described a Metopus occurring in water from a small pool in the neighborhood of Guelph, Canada, expressing an opinion that it constituted a new species, but refraining from naming it until I should have had an opportunity of examining other specimens. Lately I have found several examples in sediment from cistern water in the same city, the study of which has convinced me of the correctness of my supposition.

Only one species of Metopus has hitherto been described, *M. sigmoides* Cl. & L., and under it Stein includes several varieties characterized by difference in form, but passing into each other by gradations, the same individual assuming different shapes at different periods of its existence, so that a mere difference in outline cannot be considered as a sufficient cause for the establishment of a new species. Stein describes three well-marked forms, the normal, the shortened and the rolled up. The individual described in the paper mentioned above was of the normal shape, those I have lately found may be described as belonging to the shortened type. The annexed figure represents one of them tolerably correctly.

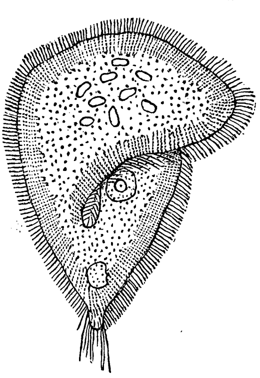
FIG. 1.—*Metopus striatus.*

They measured about .08$^{\rm mm}$, while the normal form was about double that, or .17$^{\rm mm}$. At first sight they recalled the form of a young Polygordius larva. The bent-over portion constitutes about one-half of the entire animal, and lies in a plane parallel to that of the posterior portion of the body which tapers somewhat suddenly posteriorly, so as to have a slightly pyriform outline. The axis of the bent-over portion, or "stirn-kuppe," is almost at right angles with that of the posterior portion. In the "stirn-kuppe" are a number of strongly refracting granules, as figured by Stein, and the body is terminated posteriorly by a bunch of bristle-like cilia.

The chief points wherein this shortened form differs from that described by Stein are as follows .

1st. The greater bending over of the anterior portion of the body, so that it is at right angles to the posterior portion.

2d. The greater breadth of the body in comparison to its length, and the abrupt tapering posteriorly.

3d. The striation of the border of the body.

In the description of the normal form I indicated the features in which it differs from Stein's ; certain of these are still recognizable in the shortened form, others have disappeared, and others I did not have an opportunity of deciding upon. The plane of the bent-over portion in the normal form is at right angles to that of the posterior portion, in the shortened form it is parallel. The anal aperture I was not able to detect in the shortened form, but only one contractile vesicle, situated posteriorly, was present; the second anterior vesicle seen in a normal form was probably pathological, since it was not observed until after some days had elapsed since the animalcules had been placed in confinement below the cover-glass. The striation of the border of the body was well marked in both forms, and was one of the most noticeable features. It has not been represented in any figures of *M. sigmoides*, and it may be concluded that it was absent, for if present it could not fail to have been delineated. On account of this peculiarity, present in both the forms, which resemble each other so slightly, but which are evidently the same species, I propose to name the form *M. striatus*. Although certain features characteristic of the normal form are thus absent from the shortened, still the normal form and that of *M. sigmoides* have very distinct differences, and so with the two shortened forms, and there is therefore a strong probability of the distinctness of the species.

I may mention here that for killing Infusoria, provided only a temporary preparation is required, I find a saturated solution of corrosive sublimate in water the most useful of any I have tried.[1] A drop or two run under the cover-glass produces almost instant death without any of the shrinkage so annoying even with osmic acid. After this treatment I find that staining with aniline blue, black or Bismarck brown takes place very rapidly and very satisfactorily.—*J. Playfair McMurrich, Agricultural College, Guelph, Canada.*

LIFE-HISTORY OF THE HYPOPUS STAGE OF CERTAIN MITES.—From a careful series of experiments and observations, Mr. A. D. Michael, in a paper read to the Linnean Society of London, concludes that true "Hypopi" are not adult animals, but only a stage, or heteromorphous nymphs of Tyroglyphus and allied genera. Nor do all individuals become "Hypopi," which latter stage takes place during the second nymphal ecdysis. It seems a provision of nature for the distribution of the species irrespective of adverse conditions. "Hypopi" are not truly parasitic, nor do they confine themselves to any particular insect. A new adult form described is called by the author *Disparipes bombi*, and he believes there are other species of the genus. Donnadieu's bee-parasites are admitted to be adults, though it is uncertain if they are identical with Dufour's Trichodactylus.

DOES THE CROW BLACKBIRD EAT CRAYFISH?—In the NATURALIST for November, 1881, this question is asked by Professor F. E. L. Beal, of the Iowa Agricultural College; in answer to it Mr. Charles Aldrich, in the January, '82, NATURALIST, says it probably does, as he has seen a crayfish in the jaws of a blackbird. A few days ago, while investigating the food of some young blackbirds taken from a nest in an evergreen near the river, I found an abdomen of a crayfish in one of the stomachs, thus proving beyond all doubt that the young, at least, do eat crayfish.—*Clarence M. Weed, Mich. Agr. Col.*

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[1] Meckel's fluid with acetic acid, as recommended by Brass, I have not yet tested.

ZOOLOGICAL RESULTS OF THE ROMANCHE EXPEDITION TO CAPE HORN.—Among the treasures gathered by this expedition and exhibited in the Palais de l'Industrie, are a skeleton of *Balænoptera sibbaldii*, another of *B. patachonica*, several of *Otaria jubata*, a single specimen of *Vespertilio chilensis*, several examples, some living, of the small domestic dog of the Fuegians, a *Lutra felina* and four species of Mus, two of which, *M. flavescens* and *M. xanthorhinus*, are rare. Out of 477 examples of Aves only forty species are terrestrial. Among the penguins *Microdyptes serresiana* has hitherto been known from a single specimen only. Among the fishes *Lycodes obscurus*, a species related to Cyclopterus, and the genus Lepidochnictys are new. Fresh-water fishes are represented by *Galaxias maculatus* and *Notothenia tessellata*. The predominating genera of mollusks are Oscabrion, Patella and Mytilus. All the large species are edible. The large mussel shells, fixed upon a stone handle, are used by the Fuegians as knives.

Among the mollusks are Chitons, Volutes, Succineas and Chilias, many of them new, but there are no fresh-water shells, and only three or four small Helices. Echini, which are a valued article of food to the Fuegians in July and August (the end of winter) are abundant, and the starfishes include *Labidiaster radiosus*, which has evident relations to Brisinga, and *Ctenodiscus australis*. The collection of insects is not only interesting on account of the new species, but because of numerous forms which were previously known only from parts of South America near the equator.

ZOOLOGICAL NOTES.—*Sponges.*—The *Challenger* report upon the calcareous sponges is the work of Mr. A. Polejaeff, of Gratz. Thirty species were recognized, twenty-three of which are new. The author places the sponges among the Cœlenterata as a subclass, of which the group of calcareous sponges constitutes the two orders of Homocœla (Asconidæ) and Heterocœla, with the three families Syconidæ, Leuconidæ and Teichonidæ.

Cœlenterates.—H. W. Conn and H. G. Beyer (Stud. from the Biol. Lab. J. Hopk. Univ., 1883), describe the various nerve structures of Porpita. These consist of nerve ganglion cells, about $\frac{1}{2000}$ of an inch in diameter, usually tripolar, but sometimes bipolar, with a thread-like process from each pole; and of some hundreds of small ectodermal pockets arranged around the edge of the velum. These pockets are formed of much enlarged ectodermal cells, some of which have a distinct nucleus and nucleolus. They would seem to be organs of touch.

Mollusks.—By far the greater part, if not the whole, of the primitive kidneys of Helix have been ascertained by M. P. de Meuron to be of ectodermal origin. The walls of these organs have all the characters of regular epithelium, there is a wide external opening, and M. de Meuron is convinced of the existence of an internal orifice furnished with vibratile cilia directed backwards. The true kidneys in the same genus are composed partly of an ectodermal invagination, and partly of mesodermal structure. The two parts unite early and so closely that they cannot be distinguished. The kidney then increases rapidly and takes the shape of the letter S, one extremity terminating at the bottom of a fold of the pallial cavity, while the other opens into that of the pericardium. M. Grobben considers the cavity of the pericardium as the remains of the primitive cœloma, but M. de Meuron sees in it the cavity of the posterior of the two somites of a mollusk. The primitive kidneys thus represent the excretory organ of the first somite; and the true kidneys that of the second somite.——Professor H. L. Osborn (Stud. from the Biol. Lab. J. Hopk. Univ.), gives an account of his studies upon the structure and growth of the shell of the oyster. A thin circular glass was inserted between the outside of the mantle and the inside of the shell, and the secretion examined. After twenty-four hours a thin gummy deposit, with in some cases a few lime crystals, was found. This was clearly a viscid secretion from the surface cells of the mantle. In a second twenty-four hours the glass was enveloped in a leathery brown membrane, like the epidermis of a shell, but containing calcium carbonate in solution. A film six days old had lost its leathery character and become strong, and after three or four weeks the glass is completely coated with white shell, principally formed of the mother-of-pearl layer.

Crustaceans.—The *Challenger* report upon the Cirripedia is by Dr. P. P. C. Hoek. Seventy-eight species are represented, only nineteen of which were previously known. Of the thirty-four genera of Cirripedia now known, twenty-eight have not been found below 150 fathoms; two occur from the shore to 400 fathoms, Balanus reaches to 510 fathoms, Dichelaspis to 1000, and Scalpellum and Verruca have been observed below 1000 fathoms. Forty species of Scalpellum were added by the *Challenger* to the eleven before known. As with fossil Scalpelli, the species are numerous, the individuals rare. Ten species of Verruca were found, six of them new. The distribution of this genus is world-wide, and the six new species inhabit depths of from 500 to 1900 fathoms.——The *Challenger* report of Dr. G. S. Brady on the Copepoda contains descriptions of 106 species, including eleven new genera. The specimens were almost entirely taken with a surface net. From the equator to the poles it seems certain that the ocean supports everywhere an abundance of Entomostraca, chiefly Copepoda, and the cold waters of the polar regions seem even more favorable to these animals than the tropics. The species, as a rule, have a wide distribution, but some, as *Calanus finmarchicus*, seem to be arctic, while others, as *Undina darwinii* and *Euchæta prestandreæ* belong to warmer seas. The only undoubted deep-sea species is *Pontostratiotes abyssicola*, dredged in 2200 fathoms. This was previously described in MS. by Dr. von Willemoes Suhm as *Lernæa abyssicola* and was found on *Ceratias uranoscopus* dredged in 2400 fathoms.

Tunicates.—M. L. Roule has studied the genus Rhopalea, an ascidian abundant near Marseilles at a depth of fifty to sixty meters. Rhopalea does not reproduce by budding, and may be considered as forming a link between the simple and the compound tunicates.

Batrachians.—M. G. Calmels finds in the poison of batrachians a small portion of methylcarbylamine, which gives to the liquid some of its odor and toxic qualities; it also contains, in larger quantities, an acid from which the methylcarbylamine is formed.

Birds.—Herr Stieneger informs *Naturen* that Kamtschatka has four species of sea-eagle, *Haliaëtus hypoleucus*, *H. albicilla*, *H. leucocephalus*, and *Thalassaëtus pelagicus.* The first of these is distinguished from the others by the dazzling whiteness of some parts of the body and by its generally lighter color. Among the cetacean crania collected, three seem to belong to a new species.

Mammals.—Dr. P. Albrecht, in a communication to the Anthropological Society of Brussels, maintains that there are primitively four intermaxillaries, and that hare-lip, which is never central, takes place by the separation of the inner and outer intermaxillaries of one or the other side. As proof of this, he figures cases of double hare-lip, in which the two inner bones (endognathia) stand out as a separate bone anchylosed in the median line, while each outer intermaxillary, bearing its incisor, is united to the maxillary. In the Ornithorhynchus, as figured in a communication of the same observer to the Pathological Society of Brussels, the two outer intermaxillaries (mesognathia) are large and widely separated, while between them, but further back, is a single bone, which is by M. Albrecht homologized with the endognathia. On each side of this is an incisive canal. Behind the mesognathia are two large submaxillaries or exognathia.

PHYSIOLOGY.[1]

CONNECTION BETWEEN PHYSIOLOGICAL ACTION AND CHEMICAL CONSTITUTION OF DRUGS.—Dr. Blake states very confidently that a physiological classification may be made of chemical substances according to their isomorphism and atomic weights. Isomorphous substances, regardless of chemical composition, have the same general physiological action. He found, moreover, "that amongst the salts of the metallic elements the intensity of their physiological action was connected with the atomic weight of the element, so that when the elements are arranged in isomorphous

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[1] This department is edited by Professor HENRY SEWALL, of Ann Arbor, Michigan.